IT IS CLAIMED

1. A method for controlling bandwidth resources used on a communication line in a data network, wherein a first end of the communication line is connected to a first entity, and a second end of the communication line is connected to a second entity, the method comprising:

determining a first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmitting data parcels which include meaningful data; and

transmitting preempt data parcels over the communication line to thereby cause the first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmitting data parcels which include meaningful data;

wherein the preempt data parcels correspond to disposable data parcels which include non-meaningful data.

2. The method of claim 1 wherein further comprising transmitting the preempt data parcels as a continuous bit stream.

3. The method of claim 1 wherein the preempt data parcels correspond to data parcels associated with a constant bit rate communication flow.

4. The method of claim 1 wherein the preempt data parcels have a relative higher priority than non-preempt data parcels transmitted over the communication line.

5. The method of claim 1 further comprising using a second portion of bandwidth on the communication line to transmit client data parcels from at least one client flow;

the second portion bandwidth being different than said first portion of bandwidth.

6. The method of claim 1 further comprising:

scheduling a client data parcel for transmission over the communication line; and

scheduling a preempt data parcel for transmission over the communication line;

wherein the scheduling of the preempt data parcel takes priority over the scheduling of the client data parcel for a given time slot.

7. The method of claim 1 further comprising:

determining a second desired portion of bandwidth on the communication line to be used by the first entity for transmitting data parcels which include meaningful data.

8. The method of claim 1 wherein the first entity corresponds to a customer entity; and

wherein the second entity corresponds to a service provider entity.

9. The method of claim wherein the first end corresponds to an egress side of the communication line; and

wherein the second end corresponds to an ingress side of the communication line.

10. The method of claim 1 further comprising generating the preempt data parcels at the first entity.

11. The method of claim 10 wherein the preempt data parcels are generated at a scheduler residing at the first entity.

12. The method of claim 10 wherein the preempt data parcels are generated in response to a signal initiated by a scheduler residing at the first entity.

13. The method of claim 10 wherein said scheduling is performed by a scheduler, said scheduler being devoid of a local clock source.

14. The method of claim 10 wherein the scheduling operations are performed by a scheduler; and

wherein the scheduling operations are not based on an internal time reference.

15. The method of claim 1 further comprising controlling an effective usable bandwidth by the first entity for transmitting over the communication line data parcels which include meaningful data by transmitting preempt data parcels over the communication line.

16. The method of claim wherein the corresponds to a connection shaping technique implemented at egress port of a communication link.

17. The method of claim wherein the corresponds to a connection shaping technique implemented at a client entity.

18. The method of claim 17 wherein the connection shaping technique does not use a clock source to throttle an output bit stream transmitted over the communication line.

19. The method of claim 1 further comprising:

receiving, at the second entity, a preempt data parcel at an ingress port of the communication line, the preempt data parcel including non-meaningful data;

receiving, at the second entity, a non-preempt data parcel at the ingress port of the communication line, the non-preempt data parcel including meaningful data;

disposing the preempt data parcel; and

forwarding the non-preempt data parcel to a final destination address.

20. The method of claim 1 wherein said determining includes determining an appropriate ratio of preempt data parcels to be inserted into an output bit stream transmitted over the communication line to thereby limit an effective usable bandwidth of the communication line to be used by the first entity for transmitting data parcels which include meaningful data.

21. The method of claim 1 further comprising continuously transmitting a continuous stream bits over the first communication line during normal operation of the communication line.

22. The method of claim 1 wherein the first communication line corresponds to a communication line utilizing an ATM protocol; and

wherein the preempt data parcels correspond to ATM idle cells.

23. The method of claim 1 wherein the first communication line corresponds to a communication line utilizing a frame relay protocol; and

wherein the preempt data parcels correspond to disposable frames which include predefined flag bytes.

24. A method for implementing connection shaping at one end of a communication line in a data network, wherein a first end of the communication line is connected to a first entity, and a second end of the communication line is connected to a second entity, the method comprising:

determining a first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmitting data parcels which include meaningful data; and

scheduling preempt data parcels to be included in an output stream provided to physical layer logic for transmission over the first communication line to thereby cause the first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmitting data parcels which include meaningful data;

wherein the preempt data parcels correspond to disposable data parcels which include non-meaningful data.

25. The method of claim 24 further comprising:

scheduling selected client data parcels, associated with at least one client flow, to be included in the output stream provided to physical layer logic for transmission over the first communication line;

determining an appropriate ratio of preempt data parcels to be inserted into an output bit stream transmitted over the communication line to thereby limit an effective usable bandwidth of the communication line to be used by the first entity for transmitting data parcels which include meaningful data; and

generating the output stream;

wherein the output stream includes client data parcels and preempt data parcels.

26. The method of claim 24 wherein the output stream includes a uniform pattern of client data parcels and preempt data parcels.

27. The method of claim 24 wherein the output stream includes a uniform pattern of client data parcels and preempt data parcels; and

wherein the method further comprises repeating the uniform pattern of client data parcels and preempt data parcels on a periodic basis.

28. The method of claim 25 wherein further comprising transmitting the output stream over the communication line.

29. The method of claim 24 wherein the preempt data parcels have a relative higher priority than non-preempt data parcels transmitted over the communication line.

30. The method of claim 25 further comprising using a second portion of bandwidth on the communication line to transmit the client data parcels;

the second portion bandwidth being different than said first portion of bandwidth.

31. The method of claim 24 wherein the scheduling of the preempt data parcel takes priority over the scheduling of the client data parcel for a given time slot.

32. The method of claim 24 wherein the first entity corresponds to a customer entity; and

wherein the second entity corresponds to a service provider entity.

33. The method of claim wherein the first end corresponds to an egress side of the communication line; and

wherein the second end corresponds to an ingress side of the communication line.

34. The method of claim 24 further comprising generating the preempt data parcels at the first entity.

35. The method of claim 24 wherein the preempt data parcels are generated at a scheduler residing at the first entity.

36. The method of claim 24 wherein the preempt data parcels are generated in response to a signal initiated by a scheduler residing at the first entity.

37. The method of claim 24 wherein said scheduling is performed by a scheduler, said scheduler being devoid of a local clock source.

38. The method of claim 34 wherein the scheduling operations are not based on an internal time reference.

39. The method of claim 24 further comprising controlling an effective usable bandwidth by the first entity for transmitting over the communication line data parcels which include meaningful data by transmitting preempt data parcels over the communication line.

40. The method of claim 24 wherein the connection shaping technique does not use a clock source to throttle an output bit stream transmitted over the communication line.

41. The method of claim 24 further comprising:

receiving, at the second entity, a preempt data parcel at an ingress port of the communication line, the preempt data parcel including non-meaningful data;

receiving, at the second entity, a non-preempt data parcel at the ingress port of the communication line, the non-preempt data parcel including meaningful data;

disposing the preempt data parcel; and

forwarding the non-preempt data parcel to a final destination address.

42. The method of claim 24 further comprising continuously transmitting a continuous stream bits over the first communication line during normal operation of the communication line.

43. The method of claim 24 wherein the first communication line corresponds to a communication line utilizing an ATM protocol; and

wherein the preempt data parcels correspond to ATM idle cells.

44. The method of claim 24 wherein the first communication line corresponds to a communication line utilizing a frame relay protocol; and

wherein the preempt data parcels correspond to disposable frames which include predefined flag bytes.

45. A system for controlling bandwidth resources used on a communication line in a data network, wherein a first end of the communication line is connected to a first entity, and a second end of the communication line is connected to a second entity, the system comprising:

at least one processor;

at least one interface configured or designed to provide a communication link to at least one other network device in the data network; and

memory;

the system being configured or designed to determine a first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmit data parcels which include meaningful data; and

the system being further configured or designed to transmit preempt data parcels over the communication line to thereby cause the first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmit data parcels which include meaningful data;

wherein the preempt data parcels correspond to disposable data parcels which include non-meaningful data.

46. The system of claim 45 being further configured or designed to transmit the preempt data parcels as a continuous bit stream.

47. The system of claim 45 wherein the preempt data parcels correspond to data parcels associated with a constant bit rate communication flow.

48. The system of claim 45 wherein the preempt data parcels have a relative higher priority than non-preempt data parcels transmitted over the communication line.

49. The system of claim 45 being further configured or designed to use a second portion of bandwidth on the communication line to transmit client data parcels from at least one client flow;

the second portion bandwidth being different than said first portion of bandwidth.

50. The system of claim 45 being further configured or designed to schedule a client data parcel for transmission over the communication line; and

the system being further configured or designed to schedule a preempt data parcel for transmission over the communication line;

wherein the schedule of the preempt data parcel takes priority over the schedule of the client data parcel for a given time slot.

51. The system of claim 45 being further configured or designed to determine a second desired portion of bandwidth on the communication line to be used by the first entity for transmitting data parcels which include meaningful data.

52. The system of claim 45 wherein the first entity corresponds to a customer entity; and

wherein the second entity corresponds to a service provider entity.

53. The system of claim wherein the first end corresponds to an egress side of the communication line; and

wherein the second end corresponds to an ingress side of the communication line.

54. The system of claim 45 being further configured or designed to generate the preempt data parcels at the first entity.

55. The system of claim 54 wherein the preempt data parcels are generated at a scheduler residing at the first entity.

56. The system of claim 54 wherein the preempt data parcels are generated in response to a signal initiated by a scheduler residing at the first entity.

57. The system of claim 54 wherein said schedule is performed by a scheduler, said scheduler being devoid of a local clock source.

58. The system of claim 54 wherein the schedule operations are performed by a scheduler; and

wherein the schedule operations are not based on an internal time reference.

59. The system of claim 45 being further configured or designed to control an effective usable bandwidth by the first entity for transmitting over the

communication line data parcels which include meaningful data by transmit preempt data parcels over the communication line.

60. The system of claim 45 being further configured or designed to not use a clock source to throttle an output bit stream transmitted over the communication line.

61. The system of claim 45 fur being further configured or designed to receive a preempt data parcel at an ingress port of the communication line, the preempt data parcel including non-meaningful data;

the system being further configured or designed to receive a non-preempt data parcel at the ingress port of the communication line, the non-preempt data parcel including meaningful data;

the system being further configured or designed to dispose of the preempt data parcel; and

the system being further configured or designed to forward the non-preempt data parcel to a final destination address.

62. The system of claim 45 being further configured or designed to determine an appropriate ratio of preempt data parcels to be inserted into an output bit stream transmitted over the communication line to thereby limit an effective usable bandwidth of the communication line to be used by the first entity for transmitting data parcels which include meaningful data.

63. The system of claim 45 being further configured or designed to transmit a continuous stream bits over the first communication line during normal operation of the communication line.

64. The system of claim 45 wherein the first communication line corresponds to a communication line utilizing an ATM protocol; and

wherein the preempt data parcels correspond to ATM idle cells.

65. The system of claim 45 wherein the first communication line corresponds to a communication line utilizing a frame relay protocol; and

wherein the preempt data parcels correspond to disposable frames which include predefined flag bytes.

66. A system for implementing connection shaping at one end of a communication line in a data network, wherein a first end of the communication line is connected to a first entity, and a second end of the communication line is connected to a second entity, the system comprising:

a scheduler adapted to determine a first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmit data parcels which include meaningful data; and

the scheduler being configured or designed to schedule preempt data parcels to be included in an output stream provided to physical layer logic for transmission over the first communication line to thereby cause the first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmit data parcels which include meaningful data;

wherein the preempt data parcels correspond to disposable data parcels which include non-meaningful data.

67. The system of claim 66 being further configured or designed to schedule selected client data parcels, associated with at least one client flow, to be included in the output stream provided to physical layer logic for transmission over the first communication line;

the scheduler being further configured or designed to determine an appropriate ratio of preempt data parcels to be inserted into an output bit stream transmitted over the communication line to thereby limit an effective usable bandwidth of the communication line to be used by the first entity for transmitting data parcels which include meaningful data; and

the scheduler being further configured or designed to generate the output stream;

wherein the output stream includes client data parcels and preempt data parcels.

68. The system of claim 66 wherein the output stream includes a uniform pattern of client data parcels and preempt data parcels.

69. The system of claim 66 wherein the output stream includes a uniform pattern of client data parcels and preempt data parcels; and

wherein the system further comprises repeating the uniform pattern of client data parcels and preempt data parcels on a periodic basis.

70. The system of claim 67 wherein the system is further configured or designed to transmit the output stream over the communication line.

71. The system of claim 66 wherein the preempt data parcels have a relative higher priority than non-preempt data parcels transmitted over the communication line.

72. The system of claim 67 being further configured or designed to use a second portion of bandwidth on the communication line to transmit the client data parcels;

the second portion bandwidth being different than said first portion of bandwidth.

73. The system of claim 66 wherein the scheduling of the preempt data parcel takes priority over the schedule of the client data parcel for a given time slot.

74. The system of claim 66 wherein the first entity corresponds to a customer entity; and

wherein the second entity corresponds to a service provider entity.

75. The system of claim wherein the first end corresponds to an egress side of the communication line; and

wherein the second end corresponds to an ingress side of the communication line.

76. The system of claim 66 being further configured or designed to generate the preempt data parcels at the first entity.

77. The system of claim 66 wherein the preempt data parcels are generated at a scheduler residing at the first entity.

78. The system of claim 66 wherein the preempt data parcels are generated in response to a signal initiated by a scheduler residing at the first entity.

79. The system of claim 66 wherein said scheduling is performed by a scheduler, said scheduler being devoid of a local clock source.

80. The system of claim 76 wherein the scheduling operations are not based on an internal time reference.

81. The system of claim 66 being further configured or designed to control an effective usable bandwidth by the first entity for transmitting over the communication line data parcels which include meaningful data by transmitting preempt data parcels over the communication line.

82. The system of claim 66 being further configured or designed to not use a clock source to throttle an output bit stream transmitted over the communication line.

83. The system of claim 66 to receive a preempt data parcel at an ingress port of the communication line, the preempt data parcel including non-meaningful data;

the system being further configured or designed to receive a non-preempt data parcel at the ingress port of the communication line, the non-preempt data parcel including meaningful data;

the system being further configured or designed to dispose of the preempt data parcel; and

the system being further configured or designed to forward the non-preempt data parcel to a final destination address.

84. The system of claim 66 being further configured or designed to continuously transmit a continuous stream bits over the first communication line during normal operation of the communication line.

85. The system of claim 66 wherein the first communication line corresponds to a communication line utilizing an ATM protocol; and

wherein the preempt data parcels correspond to ATM idle cells.

86. The system of claim 66 wherein the first communication line corresponds to a communication line utilizing a frame relay protocol; and

wherein the preempt data parcels correspond to disposable frames which include predefined flag bytes.

87. A computer program product for controlling bandwidth resources used on a communication line in a data network, wherein a first end of the communication line is connected to a first entity, and a second end of the communication line is connected to a second entity, the computer program product comprising:

a computer usable medium having computer readable code embodied therein, the computer readable code comprising:

computer code for determining a first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmitting data parcels which include meaningful data; and

computer code for transmitting preempt data parcels over the communication line to thereby cause the first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmitting data parcels which include meaningful data;

wherein the preempt data parcels correspond to disposable data parcels which include non-meaningful data.

88. A computer program product for implementing connection shaping at one end of a communication line in a data network, wherein a first end of the communication line is connected to a first entity, and a second end of the communication line is connected to a second entity, the computer program product comprising:

a computer usable medium having computer readable code embodied therein, the computer readable code comprising:

computer code for determining a first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmitting data parcels which include meaningful data; and

computer code for scheduling preempt data parcels to be included in an output stream provided to physical layer logic for transmission over the first communication line to thereby cause the first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmitting data parcels which include meaningful data;

wherein the preempt data parcels correspond to disposable data parcels which include non-meaningful data.

89. The computer program product of claim 88 further comprising:

computer code for scheduling selected client data parcels, associated with at least one client flow, to be included in the output stream provided to physical layer logic for transmission over the first communication line;

computer code for determining an appropriate ratio of preempt data parcels to be inserted into an output bit stream transmitted over the communication line to thereby limit an effective usable bandwidth of the communication line to be used by the first entity for transmitting data parcels which include meaningful data; and

computer code for generating the output stream;

wherein the output stream includes client data parcels and preempt data parcels.

90. A system for controlling bandwidth resources used on a communication line in a data network, wherein a first end of the communication line is connected to a

first entity, and a second end of the communication line is connected to a second entity, the system comprising:

means for determining a first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmitting data parcels which include meaningful data; and

means for scheduling preempt data parcels to be included in an output stream provided to physical layer logic for transmission over the first communication line to thereby cause the first desired portion of bandwidth on the communication line to be prevented from being used by the first entity for transmitting data parcels which include meaningful data;

wherein the preempt data parcels correspond to disposable data parcels which include non-meaningful data.

91. The system of claim 90 further comprising:

means for scheduling selected client data parcels, associated with at least one client flow, to be included in the output stream provided to physical layer logic for transmission over the first communication line;

means for determining an appropriate ratio of preempt data parcels to be inserted into an output bit stream transmitted over the communication line to thereby limit an effective usable bandwidth of the communication line to be used by the first entity for transmitting data parcels which include meaningful data; and

means for generating the output stream;

wherein the output stream includes client data parcels and preempt data parcels.